

ENTOMOLOGICAL NEWS

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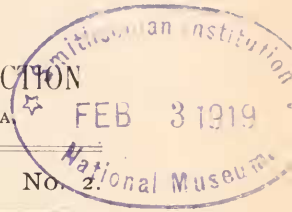
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Odonata Anisoptera from Guatemala

Collected by Messrs. William Schaus and John T. Barnes.

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.

(Plate III)

Messrs. Schaus and Barnes, whose extensive collecting of Lepidoptera in Guiana, Mexico and Costa Rica is well known, turned their energies to Guatemala in February, 1915, remaining in that country until April, 1918. During that period they sent to me from time to time a number of Odonata which add to our knowledge of the fauna of Guatemala over and above that recorded in the Neuroptera volume of the *Biologia Centrali-Americana*. I have listed them, following the order of the species in the *Biologia* and occasionally adding some descriptive matter. Mr. Schaus made some notes on the fresh colors of some of the specimens and these I have enclosed in quotation marks. He has also given me data on some of the more unfamiliar localities at which they took Odonata, as follows:

Caballo Blanco, "13 miles beyond Retalhuleu on the branch line to Champerico; it consists of grazing country with a little vegetation along the rivers, but no forest near at hand, and the soil is humid and very fertile."

Cayuga, 23.4 miles from Puerto Barrios and a little west of Tene-dores. A farm house recently abandoned was fitted up by the United Fruit Company and placed at their disposal; it was their Guatemalan headquarters. "The house stands on a hill by itself, 150 feet above the railway and river, with the most glorious views in every direction. The chief veranda faces the south with the winding [Motagua] river threading through thousands of acres of bananas, limited by virgin forests, and with the mountains of Honduras in the distance; to the north we are close to forest clad hills and almost all my day collecting is along [their] trails and streams. The elevation of the [railway] station is 107 feet and the forest ridge about 400 feet higher. The hills...on the south side are covered with dense tropical forest, no pines at all." On October 7, 1915, he wrote: "I cannot understand why with the heat and rain there are not more things flying." On April 30, 1917: "The conditions here (climatic) are still disastrous and not an insect is to be seen except a few wasps. Not a drop of rain has fallen since I last wrote and all the weeds around the place are dead and dried up and there are extensive forest fires, fanned into energy by strong easterly gales which blow all afternoon and evening."

Chejel, in Baja Vera Paz, eleven miles from Tucuru, elevation 3100 feet. "I have had five weeks at Chejel, where I have been visiting most charming friends" [in June, etc., 1917].

Iguana, "a flag station, 72.3 miles from Barrios, elevation 493 feet, and at the beginning of the dry section of the Motagua valley; the country is hilly, with scattered pines and swampy in places. We only went there once for a few hours and found your Odonata flying in the wet places."

Joaquina, "a flag station, 170 miles from Barrios, elevation 2269 feet; a dry district owing to steep mountains with muddy ditches along track in rainy season, little vegetation and some 200 feet above river. We were delayed there several hours by a land-slide, so I put my net on and caught a few insects."

Montufar, "44 miles from Barrios (Motagua valley)."

Oncida, "Motagua valley near Morales, 25 miles from Barrios, elevation 300 feet."

Polochic River. Writing Aug. 17, 1917: "I am still in Vera Paz. . . . since a week I have worked every night with my lamp until 3 A. M. Barnes is doing the day work and rides nine miles down the mountains to the Polochic River and gets in several hours' collecting."

Purulhá "is the correct spelling, not Purula, as Champion spells it."

In the letter just quoted: "I have had.....three weeks at Purullá."

Quirigua "is 57.4 miles from Barrios, elevation 240 feet, and is in the humid banana district. The Motagua valley is very broad there, with hills on the south side covered with forest of poor growth, chiefly pines and the manaca palms; there are small streams in all the valleys. The forest in the main valley has all been cleared by the Fruit Co." In their first year in Guatemala they had a month or six weeks at Quirigua before going to Cayuga.

San Felipe, "in the department of Retalhuleu, elevation 2056 feet, surrounded by sugar cane and coffee plantations."

Santa Maria, Volcano, department of Quezaltenango, elevation 5500 feet.

Tactic, Baja Vera Paz; "ten days in Tactic" (Aug. 17, 1917).

GOMPHINAE.

Gomphoides elongata Selys. Gualan, August, 1 ♂.

Very close to the only male of *elongata* which is available for comparison, viz., from Guadalajara, Jalisco, Mexico, July, by Schumann, listed in the *Biologia* volume, page 157. This Gualan male is smaller (abdomen 43.5, hind wing 31 mm.), less robust, the lateral margins of abdominal segments 8 and 9 are less dilated, that of 9 less angulate, angle distinctly rounded, superior anteapical angulation of the superior appendages also rounded.

Gomphoides suasa suasa Selys. Cayuga, May, 1917, 1 ♂. Quirigua, forest, June 25, 1 ♂, 1 ♀.

Erpetogomphus schausi n. sp. (Pl. III, figs. 1-6).

Purullá, forest stream, July 7, 1 ♂, *type*, in the writer's collection at the Academy of Natural Sciences of Philadelphia.

♂. Black or blackish brown, the following bright green: greater part of the frons (except its postero-dorsal and antero-ventral margins), the rhinarium, a transverse streak on the middle of the free margin of the labrum, the greater (anterior) part of the fore prothoracic lobe, anterior margin of the propleuron, the greater part of the transverse dorsal mesothoracic ridge (but not where it joins the mid-dorsal carina or the humeral suture), an antehumeral stripe separating the dark submedian and antehumeral stripes, increasing in width cephalad and ventrad and confluent with the green of the transverse mesothoracic ridge just mentioned (at mid-height this green antehumeral stripe is a little wider than half of the dark submedian and narrower than the dark antehumeral stripe), a rounded triangular spot just below the antealar sinus and anterior to the humeral suture,

almost confluent with the upper end of the green antehumeral stripe (this spot apparently represents the upper end of an otherwise obsolete pale humeral stripe), a mesepimeral stripe wider above, a rounded superior spot and an inferior stripe on the metepisternum, a wider stripe on the metepimeron (each of these three sclerites being margined with black on all sides, but the postero-ventral angle of the metepimeron is green), and the dorsal interalar sclerites. (Pl. III, figs. 1, 2.)

Mandibles, maxillae and labium buff, but the apices of the first two and of the median and lateral labial lobes black.

Ventral thoracic surface dull greenish with pruinose traces in the depressions.

Abdomen blackish-brown, its pale markings evidently faded, such as are visible being the sides of 1 inferiorly, the auricles, a postero-ventral spot and possibly a mid-dorsal stripe on 2, a mid-dorsal basal stripe or spot of indeterminable extent on 3-6, a basal lateral spot on the same four segments, the basal half of 7, a large (reddish) spot on each side of 10.

Femora reddish-brown, blackening distally, fore pair pale greenish inferiorly. Tibiae and tarsi wholly black.

Occiput non-tuberculate, its hind margin moderately convex.

Abdomen narrowing from segment 1 (2.6 mm.) to the middle of 3 (.8 mm.), thence widening very gradually to apex of 6 (1.4 mm.), thence widening rapidly to the apex of 8 (2.6 mm.), thence narrowing to the apex of 10 (1.9 mm.).

Superior appendages (Pl. III, figs. 3, 6) 1.96 mm. long, slightly longer than 10, subequal to 9; in dorsal view, their external margins straight and parallel for two-thirds' length of the appendage, each appendage constricted at its extreme base, following which, on the internal side, it is swollen for its first third, then gradually narrows, the terminal third of the appendage strongly curved mesad forming a blunt hook; in profile view, the superior margin is almost straight for two-thirds of the length of the appendage, the inferior margin sub-parallel, but swollen a little at two-fifths of the same length, no superior or inferior teeth or tubercles, the terminal third of the appendage curved strongly ventrad to an acute apex; superior appendages yellow, brown at apex.

Inferior appendage blackish-brown, stout, two-thirds as long as the superiors; in profile view, its superior margin concave throughout except for the first fifth of the appendage's length, which is straight, slanting caudad and ventrad, and forms an obtuse angulation where the concave curve begins, terminal half of the appendage curved strongly dorsad and slightly cephalad; in ventral view, the appendage is bifid for its entire visible extent *i. e.*, its distal two-thirds, the proximal third being concealed by the sub-anal plates), the two branches in

contact with each other, their external margins slightly converging, their apices roundedly truncate from within laterad.

Genitalia of abd. seg. 2: (Pl. III, figs. 4, 5). Anterior lamina brown, low, entire, with a marginal row of brownish hairs; the other genitalia darker. Anterior hamules bifid at tip, internal branch the longer and more acute, interval separating it from external branch elliptical, narrower at the mouth. Posterior hamules one-and-two-fifths times as long as the anterior hamules, tapering to an acute apex. Vesicle of the penis projecting subequally with the anterior hamules, having on each side a stout antero-ventral angle of somewhat less than 90 degrees. Posterior margin of each auricle almost straight, slightly convex, bearing 5-6 denticles.

Wings barely smoky yellowish. Stigma dark reddish-brown within black veins, surmounting 5-6 cells. Venation, including the costa, black. Forewings with 20 (r), 18 (l) antenodals, the 7th (r) or 6th (l) thicker, 14 (r), 15 (l) postnodals, two posttriangular rows increasing near the level of the nodus with 7-8 marginal cells, a maximum of three rows of cells in the second cubital area. Hind wings with 13 (r), 14 (l) antenodals, the 6th thicker, 13 (r), 14 (l) postnodals, 3 posttriangular cells, then two rows, increasing near the level of separation of Rs bridge from M1+2, with 13-14 marginal cells, proximal row of postanal cells 5, distal row of 4, a maximum of five rows of cells in the second cubital area, anal triangle 4-celled.

Abdomen 33, hind wing 30, costal edge of stigma of fore wing 3.5 mm.

Only the type male has been seen. This handsomely colored species falls near *E. cutainia* and *E. viperinus* in the synopsis of species of *Erpetogomphus* in the Biologia volume, pages 159-160. It differs from *E. cutainia* in the absence of an inferior longitudinal carina on the basal third of the superior appendages, in the strongly ventral curvature of the terminal third of the same appendages and in the shape of their apices, the apparent absence of a second pale antehumeral stripe separating the dark antehumeral and humeral stripes, and of a yellow line on the costa anteriorly, the greater number of ante- and postnodals and the longer wings.

From *E. viperinus*, *E. schausi* differs by the presence of dark markings on the face, the stronger ventral curvature of the terminal third of the superior appendages, the apparent absence of a second pale antehumeral stripe the greater number of ante- and postnodals, etc.

Erpetogomphus diadophis ? Calvert (Plate III, figs. 10-12).

Cayuga, house, October 25, 1 ♀. Very similar to the paratype of the species (in coll. Acad. Nat. Sci., Philadelphia) in the shape of the occiput, the very reduced vulvar lamina and the characteristic semi-circular groove on the sternum of 9. It is smaller (abdomen 29, hind wing 24, costal edge of stigma, front wing 3 mm.) and the annulate appearance of the abdomen, on 3-7, due to the presence of a transverse median yellow band in *diadophis*, is on first examination not distinct, owing, perhaps, to the apparently less matured coloration of the body generally. I believe that I can recognize the annuli on segments 6 and 7, at least. Color differences, due, possibly, to the same cause (immaturity), are the smaller extent of the dark paramedian stripes of the thorax (mesepisternum) and of those at the humeral, at the obsolete first lateral and at the second lateral sutures, in comparison with those of the paratype of *diadophis*, as our figures show. (Pl. III, figs. 10 and 11, 7 and 8).

The similarity of the vulvar laminae in the two specimens is not identity. The two lobes of the lamina in the Cayuga female are relatively more widely separated than in the paratype (*cf.* Pl. III, figs. 12, 9), although the absolute measurements are as follows: from apex of right lobe to apex of left lobe, Cayuga ♀ .3 mm., *diadophis* ♀ paratype .4 mm.; length of lobes measured from the anterior (*a*) of the two transverse lines shown in Pl. III, figs. 12, 9: Cayuga ♀ .2 mm., ♀ paratype .3 mm.

In addition to the possession by both females of the semicircular groove on the ventral side of segment 9, mentioned above and shown in our figures quoted, both females show a transverse groove (*t*) on the sternum of 8, anterior to the vulvar lamina, and situated in both at three-fourths the length of the sternite, measuring from its anterior extremity to the same line *a*.

Neither the paratype of *diadophis* nor the female from Cayuga is in perfect condition; the former, ever since I received it from the late Mr. McLachlan, has lacked segment 10 and the abdominal appendages. Without additional material it is not possible to decide whether these two females are conspecific or not. All that I am able to say at present is that they appear to be very near to each other on the basis of structural characters, while differing in size and in details of coloring.

Epigomphus subobtusus Selys. Cayuga, dark forest, April 25, 1 ♀; forest, May 3, 1 teneral ♀; forest, 1 ♂ over stream, 1 teneral ♀; stream in dark forest, May 28, 1 ♂, "oblique black and greenish blue

streaks on thorax. Abdomen black with fine yellow segmental lines; a broad yellow mark before end" [*i. e.* on segment 7].

CORDULEGASTERINAE.

Cordulegaster godmani McLachlan. Purullá, forest, July 10, 1 ♂ 1 ♀ "in cop."

AESHNINAE.

Anax amazili (Burmeister). Cayuga, June 2, stormy night, at light, 1 ♀; August 24, at light, 1 ♀.

In the key to the species of *Anax* in the *Biologia* volume, page 176, I stated for *amazili* "Superior frontal marking a triangular black spot, no dark ring," by way of contrast with *junius* and *walsinghami*. In well-colored individuals there is on each side, right and left, of the triangular black spot and separated from it by a yellow line, a triangular blue spot, as Hagen (1861, 1867), Brauer (1866) and Martin (1908) have stated. Occasionally these two blue spots are not visible, as in a Costa Rican female before me; in other cases, as in the Cayuga female of June 2, the blue has become a dark brown, although the two spots are not united anteriorly and hence form no ring as in *junius* and *walsinghami*. Still my statement of 1905, quoted above, is incomplete and hence a little confusing. It may be bettered by inserting after "a triangular black spot:" "usually with a separate triangular blue (sometimes brown) spot to right and left."

The capture of these two females *at light* is interesting.

Aeshna cornigera Brauer. Chejel, June 26, 1 ♂, "almost entirely black; some pale greenish markings on thorax laterally." Purullá, forest, July 10, 1 ♂, "frons and base of abd. turquoise blue. Broad green lateral oblique stripes on thorax. Fine broken green transverse lines on abd." Antigua, 5500 feet, November 24, 1 ♂, 1 ♀. Volcan Santa Maria, November, 1 ♂.

Aeshna multicolor jalapensis (Williamson). Santa Maria, 5500 feet, June 13, 1 ♂. Volcan Santa Maria, October 31, 1 ♀.

Aeshna virens Rambur. Cayuga, on veranda, September 5, 1 ♀.

Gynacantha trifida Rambur. Cayuga, at dusk, April, 1 ♀; forest, August 23, 1 ♀, and 27, 1 ♂.

Gynacantha septima Selys. Cayuga, at dusk, April, 1 ♂; forest, September 16, 1 ♀. The male has the anal triangle 3-celled.

Gynacantha mexicana Selys. Cayuga, at dusk, June 3, 1917, 1 ♂.

Gynacantha tibiata Karsch. Cayuga, forest, August 30, 1 ♀.

Gynacantha gracilis Burmeister. Cayuga, forest, September 4, 1 ♀. This is the most northern locality for this species yet recorded; I have taken it also in Costa Rica, in the Banana River country.*

EXPLANATION OF PLATE III.

Figs. 1-6, *Erpetogomphus schausi* n. sp., type ♂, Purullá, Guatemala, July 7. Figs. 1, Dorsal, and 2, Right lateral views of the meso-metathorax showing the color pattern. x 6.6. Figs. 3, Dorsal, and 6, Left lateral, views of the apex of the abdomen. x 7. Fig. 4, Right lateral view of penis and vesicle removed from the other genitalia of the second abdominal segment, inverted. Fig. 5, Right lateral view of genitalia of the second abdominal segment, inverted, penis lying between the hamules of the right and left sides; *ah*, anterior, and *ph*, posterior, hamules; *τφ*, vesicles of the penis, *ah'*, anterior hamule viewed antero-laterally to show form of apex; *am III*, anterior margin of abdominal segment 3. Figs. 4-5 x 14.3.

Figs. 7-9, *Erpetogomphus diadophis* Calvert, ♀ paratype, Texas. Figs. 7, Dorsal, and 8, Right lateral views of meso-metathorax showing the color pattern. x 6. Fig. 9, Sternite of abdominal segment 8 and part of groove (*g*) on sternite of segment 9. x 12.

Figs. 10-12, *Erpetogomphus diadophis* ? ♀ Cayuga, Guatemala, Oct. 25. Figs. 10, Dorsal, and 11, Right lateral views of meso-metathorax showing the color pattern. x 6.5. Fig. 12, posterior part of abdominal segment 8 and all of segment 9, ventral view. x 12.75.

In figs. 9 and 12: *a*, anterior of the two transverse impressions, and *t*, transverse groove, cephalad of the vulvar lamina (*τl*) (see page 36); *g*, semicircular groove on sternite of 9.

All these figures are based on camera lucida drawings, using a Zeiss compound microscope with objective A (its lower lens off), and ocular 2 (figs. 4, 5, 9 and 12), or compensating ocular 2 (the remaining figures).

(To be continued)

Swarming of the Monarch Butterfly in Iowa (Lep.).

While driving along a country road three miles northwest of Vinton, Iowa, on Sept. 8, 1918, a swarm of Monarch butterflies (*Anosia plexippus* Linn.) attracted my attention. The immediate region is hilly, once wooded, but now only small white oak groves scattered here and there remind one of that fact. At least several hundred butterflies were in this swarm, which, at the time of my observation, did not seem to be moving in any particular direction. Some of the individuals were flying about rather aimlessly a few feet above the ground, while others had alighted on the leaves and branches of the white oak trees. The observation was made at 6.10 P. M., and it is probable that the insects were preparing to settle for the night. The weather was partly cloudy and there was little or no breeze.—DAYTON STONER, State University of Iowa, Iowa City, Iowa.

* Calvert, A. S. & P. P. A Year of Costa Rican Natural History, New York (Macmillan), pp. 315-318. 1917.